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HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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CAIN, EDWARD J

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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03/23/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM  
mkraft@hp.com  
ipa.mail@hp.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/807,025	REHMAN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Edward J. Cain	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,9,11-19,21-26,28 and 29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,9,11-19,21-26,28 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/11/09</u> .   | 6) <input type="checkbox"/> Other: _____                          |

The request for continued examination received 11 February 2009 has been made of record. Claims 1-6, 8, 9, 11-19, 21-26, 28 and 29 are pending.

Claims 21-26 and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al '035 in view of evidence supplied by Belmont et al '311.

Wang et al. disclose ink jet ink comprising water, 0.01-50% co-solvent, O. 1-10% styrene-maleic anhydride, O. 1-5% surfactant, and O. 1-10% Self-dispersing pigment possessing particle size of 0.005-1  $\mu\text{m}$ . It is noted that the styrene-maleic anhydride includes that known under the tradename SMA-1000H that has weight average molecular weight of 5,500. For specific types of self-dispersing pigments, Wang et al. points to Belmont et al. that discloses (col.4, lines 7-16 and col.5, lines 4-21 and 31-33) acid-functionalized pigment, i.e. pigment having organic group attached thereto wherein the organic comprises alkyl group and at least one acid group (paragraphs 1, 13, 17, 19-21, 24, 27, 42, 44, and 46).

Attention is drawn to black ink #3 (paragraph 56) that comprises 0.5% ammonium benzoate, 0.35% TRIS buffer, 7.5% 1,5-pentanediol, 7.5% 2-methyl-1,3-propanediol, 4.5% 2-pyrrolidone, 0.15% surfactant, i.e. Surfynol, 3% self-dispersing pigment, and 0.8% styrene-maleic anhydride, i.e. SMA-10001-1.

Given that Wang et al. disclose ink identical to that presently claimed, it is clear that the ink is inherently reliably jettable at all firing frequencies ranging from 3-25 kHz and inherently reliably jettable at drop volume from about 10 pL to 20 pL.

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In light of the above, it is clear that Wang et al. anticipate the present claims.

Claims 1-3, 6, 8, 11-13 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al '100 in view of Zhu '083 and Suzuki et al '881.

Parazak et al. disclose a system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10  $\mu$ m, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40). Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of (a) styrene-maleic anhydride and (b) printhead configured for specific firing frequency and drop volume.

With respect to difference (a), Zhu which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,000. Attention is called to col.5, lines 63-65

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of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

With respect to difference (b), Suzuki et al. disclose ink jet printer that ejects ink of 20 pL or less and that possesses firing frequency of 10 kHz or higher (col. 10, lines 31-37) in order to produce high quality image printing at high speed (col. 10, lines 31-37).

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above and for using printer configured for specific firing frequency and drop volume disclosed by Suzuki et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and to use such printer in the system of Parazak et al. in order to produce ink that produce high quality image printing at high speed, and thereby arrive at the claimed invention.

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Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Suzuki et al and further in view of Osumi et al '513.

The difference between Parazak et al. in view of Zhu and Suzuki et al. and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce a waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Suzuki et al and further in view of Ohta et al '287.

The difference between Parazak et al. in view of Zhu and Suzuki et al. and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

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Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

Claims 21-23, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu.

Parazak et al. disclose a system for printing images onto a substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 p.m, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It

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is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of styrene-maleic anhydride.

Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at all firing frequencies from 3 kHz to 25 KHz.

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and thereby arrive at the claimed invention. Parazak et al. disclose system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 p.m, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-



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acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting

Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and further in view of Osumi et al.

The difference between Parazak et al. in view of Zhu and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Suzuki et al and further in view of Ohta et al '287.

The difference between Parazak et al. in view of Zhu and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

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Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

Claims 1-3, 6, 8, 11-13 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and further in view of Oikawa et al '055.

Parazak et al. disclose a system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10  $\mu\text{m}$ , 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It

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is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of (a) styrene-maleic anhydride and (b) printhead configured for specific firing frequency.

With respect to difference (a), Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

With respect to difference (b), Oikawa et al., which is drawn to ink jet printer, disclose setting the firing frequency of the printer to several tens of kHz in order to meet demands for faster printing and higher resolution (col.2, lines 19-23).

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above and for using printer configured for specific firing frequency disclosed by Oikawa et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with

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good smudge resistance, durability, etc., and to use such printer in the system of Parazak et al. in order to produce ink that produce high resolution image when printing at high speed, and thereby arrive at the claimed invention.

Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Oikawa et al et al and further in view of Osumi et al '513.

The difference between Parazak et al. in view of Zhu and Oikawa et al. and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Oikawa et al et al and further in view of Ohta et al '287.

The difference between Parazak et al. in view of Zhu and Oikawa et al. and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

Regarding the rejection of claims 21-26 and 28-29 under 35 USC 102(e) as being anticipated by Wang et al in view of evidence in Belmont et al, Applicants have argued that the rejection is improper because "Wang never incorporates Belmont by reference".

It is the position of the examiner that Wang et al need not explicitly use the phrase "incorporate by reference" for the rejection to be proper under 35 USC 102(e). Wang et al do explicitly point to Belmont et al at paragraph 27 as describing pigments to be used in the Wang et al invention and Belmont et al is explicitly directed to ionically modified pigments and claims acid functionalized pigment at claims 10 and 11. It is the

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position of the examiner that the reference to Belmont et al by Wang et al is an explicit teaching that the pigments taught therein are suitable for the Wang et al invention.

Applicants have further argued that Wang et al fail to teach inks which are jettable at frequencies of 3-25 kHz. In the rejection of record the examiner argued that since the inks of Wang et al met the chemical limitations of the instantly claimed inks, the jettability characteristics would be inherent. Appellants have not demonstrated that such characteristics would not be inherent.

Regarding the rejection of claims 1-6, 8-9 and 11-19 under 35 USC 103 as argued by Applicants at pages 21-26 of the brief the examiner offers the following comments.

Applicants have argued that Zhu is not properly combined with Parazak since Zhu teaches away from the use of organic solvents as found in Parazak. It is the position of the examiner that since the inks of Parazak are aqueous with preferably 0.1 to 20 wt. % co-solvent (column 4, line 19) and the inks of Zhu are aqueous and "typically" contain organic solvent in amounts of "below about 20%" (column 9, line 1 ), these references are, indeed, properly combined.

Applicants have argued that the Suzuki reference fails to teach printheads with the instantly claimed firing frequency. It is the position of the examiner that the teaching of drive frequencies of about 15 kHz is a clear teaching of firing frequencies within the range claimed by Applicants.

Applicants have argued that the inherency arguments presented by the examiner for jettability of the compositions taught by Parazak and Zhu are not proper. Applicants have not presented evidence in rebuttal of the inherency argument.

Applicants' arguments concerning the Oikawa reference seem, ultimately, to lead back to whether the combination of Parazak and Zhu teach inks which are jettable over the claimed frequency range. This argument has been addressed previously.

Regarding the rejection of claims 21-26 and 28-29 as argued by Appellants at pages 26-27, Applicants' arguments are a reiteration of arguments previously presented.

Applicants have argued in their reply brief of 12 December 2008 that the examiner argues that Wang need not incorporate Belmont by reference. This is not quite correct. What the examiner stated was that Wang need not explicitly use the phrase "incorporate by reference". It is sufficient that Wang reference Belmont and point to Belmont for its teachings concerning specific suitable self dispersing pigments.

Applicants have also questioned the examiner's reference to column and line of the Wang reference in the advisory action. The examiner was in error in this reference. The rejections contained in the Examiners answer and repeated here do not make this reference nor do they depend upon the reference made in the advisory action.

Applicants have further argued that the examiner has treated the jettability limitations as merely an intended result. This is not correct. The examiner has stated

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this property to be inherent. The examiner asserts that that inherency is due to the substantive material limitations being met.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward J. Cain whose telephone number is (571) 272-1118. The examiner can normally be reached on M-F, 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Edward J. Cain  
Primary Examiner  
Art Unit 1796

/Edward J. Cain/  
Primary Examiner, Art Unit 1796